

JOB COMPLETION REPORT
DEVELOPMENT PROJECT

State of Montana

Name Western Montana Fishery Study

Project No. F-24-D-9

Title Statewide Lake and Stream Rehabilitation - Bull Creek Drainage

Job No. I

Period Covered October 1, 1957 to September 1, 1958

Abstract:

The Bull Creek drainage, located approximately 70 miles east of Missoula, was rehabilitated in October, 1957, and in April, May and August, 1958. Big Tupper, Little Tupper, Deadmans and Browns lakes; Deer Park and Bull Creek above Browns Lake; and Bull Creek between Browns and Kleinschmidt lakes were treated with liquid rotenone emulsives in October, 1957. Kleinschmidt Lake and Bull Creek between Browns and Kleinschmidt lakes were treated with liquid rotenone emulsives in April and May, 1958. Kleinschmidt Lake was retoxified with 60 percent toxaphene in August, 1958.

Objectives:

The objectives of this job were to remove the yellow perch, suckers and yellow pike perch from the Bull Creek drainage, so that it could be restocked with trout.

Techniques Used:

In October, 1957, the portion of the Bull Creek drainage, above the inlet of Kleinschmidt Lake (Big Tupper, Little Tupper, Deadmans, Browns Lakes and portions of Deer Park and Bull Creeks), was toxified with thirty-eight 55 gallon drums of Pro-Noxfish and Chem Fish Regular fish toxicant. Toxicant dispersion for the lakes was accomplished by the use of three 30-foot spray booms and one high pressure nozzle spray, mounted on out-board motor boats. Toxicant was mixed with water at the rate of 1:10, while it was being applied. Two shoreline areas of Browns Lake were too large and weedy for land or boat application of the toxicant, so were sprayed from an airplane. Toxicant was not pre-mixed with water for aerial application.

Back pumps were employed to toxify the "pothole" areas near Browns Lake. Bull Creek was also treated with the use of back pumps.

Toxicant was applied to waters of this drainage section at the rate of one part toxicant to one million parts water, by volume.

Because effective barriers could not be maintained against an unexpected small (4-6") sucker migration in the spring of 1958, Kleinschmidt Lake was toxified on May 3, 1958, even though some of the yellow perch had begun their spawning by that time.

At this time of year, Kleinschmidt Lake contained a slightly greater water volume and covered more weed and shoal areas than would have been present had the job been done in the fall. Toxicant concentration was approximately .7 ppm with increased water volume and the amount of toxicant was not increased. Shoreline and weedbed areas were treated with a helicopter, which distributed 200 gallons of Pro-Noxfish, mixed 1 to 2 with water. The helicopter carried 30 gallons of toxicant (approximately 90-100 gallons mixture) per load and made seven trips. It applied toxicant at a slow speed (20-40 mph) and was able to cover the irregularly outlined shoreline and weedbed areas with ease.

Two hundred and seventy gallons of Pro-Noxfish were applied to the surface of the open water area of Kleinschmidt Lake by two distribution boats. Spray booms were not used. In one boat, toxicant and water were mixed through a double-intake, centrifugal pump at about 10:1 water to toxicant. This mixture pumped into the boat's wake. In the other boat, a length of 1/4 inch pipe was attached to the small bung of a toxicant barrel and the terminal end of the pipe trailed in the prop wash of the outboard motor. The barrel was mounted high enough in the boat to enable the toxicant to flow out of the pipe by gravity. A valve was installed in the distribution pipe to permit regulation of the amount of toxicant flow. This second boat could cover its distribution area at full speed, since no outboard water intake line was used to pre-mix water and toxicant.

On August 19, 1958, Kleinschmidt Lake was treated with nine gallons of 60 percent toxaphene. This was calculated to give a concentration of .01 ppm by weight, when thoroughly mixed. The inlet and outlet of Kleinschmidt Lake (Bull Creek) had ceased flowing at the time of this application, and should not flow again until the spring of 1959. The toxaphene was applied by one boat using the gravity method described above. Fifty gallons of water were pumped into a standard 55 gallon drum for each distribution trip. Five gallons of toxaphene were added for one trip, two for another trip, and one each for two more trips. Even at the concentration of 1 gallon toxaphene to 50 gallons water, the mixture left a "track" on the water, which was of sufficient density to enable the boat operator to distinguish his previous "swath" across the lake. The toxaphene was distributed over the surface of the open water area of the lake. None was sprayed over weedbed or shoreline areas. The long-lasting toxicity of toxaphene, coupled with the lack of inlet or outlet flow from this lake throughout the fall overturn period, should assure sufficient mixing in this body of water.

Table 1 shows the waters treated with toxicant and amount and kind of toxicants applied.

Browns, Deadmans, Big and Little Tupper Lakes were checked for toxicity, using rainbow trout in wire mesh live cages, in the spring of 1958. In a one week period, no mortality occurred in the live cars, which could be attributed to residual toxicity.

Browns Lake was qualitatively checked for plankton, and copepod adults and nauplii were found to be numerous in all samples. Big and Little Tupper and Deadmans Lakes were planted with 300/lb. rainbow trout at 500 per acre, in early spring. Browns Lake was planted with 700-800/lb. rainbow trout, at about 300 per acre, following the plankton sampling. A late summer plant of 300/lb. rainbow trout in Browns Lake brought the total plant up to slightly over 500 fish per acre. Deer Park Creek was planted with a small number of west slope cutthroat trout, in the summer of 1958.

Findings:

Seven fish species were found in the Bull Creek drainage. Table 2 lists these species and the waters in which they were found.

Large numbers of dead fish (mostly yellow perch and suckers) were observed in Browns Lake, after toxicant application last fall. In comparison, very few dead fish were found in Kleinschmidt Lake after it was treated this spring. This difference is likely due to the fact that Kleinschmidt, having approximately 10 feet less maximum depth than Browns, had winter-killed often enough to reduce its fish population.

The earthen, stockwater dam, below Browns Lake, was considered to be an effective barrier when the Bull Creek drainage treatment was halted there in the fall of 1957. However, high water in the spring of 1958 washed over the side of part of the spillway channel on this dam and rendered it useless as a barrier against an unexpected movement of small suckers out of Kleinschmidt Lake. Prompt treatment of the creek below Browns Lake prevented immediate reinfestation of Browns Lake at that time. The presence of many more small suckers in Kleinschmidt necessitated the immediate toxification of the lower portion of the drainage, down to the two-foot drop below the culvert, at the outlet of Kleinschmidt Lake.

A helicopter was employed to spray the weedbed and shoreline areas at this time, for the following reasons:

1. More weedbed and shoal areas were present during high water than during the fall low water period.
2. Assembling and disbanding spray crews and equipment for a single job, such as this, would have approximately doubled the manpower cost of the Kleinschmidt toxicant application.
3. The pressure of other work commitments necessitated accomplishing this job in the shortest possible time.

The helicopter charge for the application of 600 gallons mixed toxicant and water was \$300.00. This charge would have been the same for applying 600 gallons of straight toxicant to the entire surface of the lake. Thus, had a good dispersing toxicant for aerial application been available, the entire lake could have been done for the same cost. Our experience had shown that the older emulsifiable rotenone formulations tended to drift along the surface of the water, when applied aerially without pre-mixing. Therefore, on this job all aerially applied toxicant was pre-mixed 1:2 with water. This increased the cost of aerial application three times over what it would have been, had straight toxicant been applied.

Three different methods of boat application of toxicant to open waters were used on the various waters of this drainage. These were: (1) Pumped, pre-mixed boom spray; (2) pumped, pre-mixed injection into the prop wash; and (3) straight toxicant injection into the prop wash by gravity. It is the consensus of the crews, who have used all three methods, that No. 3 is just as effective as Nos. 1 and 2 and is simpler and more economical, in both time and money. The lack of any necessity for an outboard intake line in method No. 3 permits full throttle operation, while distributing toxicant. Thus, even though the "track" of toxicant on the water surface is only about 1/2 as wide as methods No. 1 and 2, the boat can cover over four times as many "swaths" in a given length of time. It can cover an area in a series of criss-cross patterns that appears to give a better surface coverage than either method 1 or 2.

Recommendations:

1. Browns, Big and Little Tupper and Deadmans Lakes should be stocked again in 1959 and 1960 with rainbow trout fingerlings, according to the Montana specifications for the planting of rehabilitated lakes.
2. No immediate fishery should be planned for Kleinschmidt Lake.
3. Continued stocking of the drainage should be based upon investigation and recommendation by the fishery personnel responsible for the management of the drainage.

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